

August 1991

Agdex 114/33-37

Varietal Description of CDC Richard Hulless Two-Row Spring Barley

Origin and breeding

CDC Richard, tested as TR307 and SB85219, is a hulless two-row feed barley developed at the Crop Development Center, University of Saskatchewan. It was derived from the cross SB80211 x WPG M797-84 made in 1982. A modified pedigree selection system using in the F₂ generation a space-planted field nursery, single seed descent in a greenhouse for the F₃ and F₄ generations, single row field nursery in the F₅ generation and yield tests for the F₈ through F₉ generations was used in developing this variety. The selection criteria were yield, maturity, resistance to scald, rust and spot-form net blotch, ease of threshing, test weight, kernel size and acid extract viscosity. Breeder seed was derived from 182 F₉ lines and was first bulked in 1989.

Varietal characteristics

Plant characteristics

Coloptile color: green
Juvenile growth: erect
Leaves: medium green; medium length and width; green glabrous sheath; glabrous blade
Flag leaf: medium green; medium length and width; intermediate attitude; slightly waxy sheath; white auricles
Stem: grass green; slightly waxy; medium thickness; 4 to 5 nodes; closed, tending to v-shaped collar; straight neck; 0 to 3 cm exertion
Plant height: medium, slightly shorter than Scout and slightly taller than Abee
Heading date: mid-season
Maturity: slightly earlier than Abee and later than Scout
Tolerance to drought: good
Resistance to lodging: better than Scout; not equal to that of Condor
Resistance to straw breaking: good
Resistance to neck breaking: good

Resistance to shattering: good

Disease reaction: CDC Richard has shown resistance to stem rust (*Puccinia graminis*) and scald (*Rhynchosporium secalis*), moderate resistance to common root rot (*Helminthosporium sativum*), moderate susceptibility to loose smut (*Ustilago nuda*), surface borne smuts (*U. hordei* and *U. nigra*) and the spot form of net blotch (*Drechslera teres*), and susceptibility to speckled leaf blotch (*Septoria passerinii*) and the net form of net blotch (*D. teres*).

Spike characteristics

Type: two-row
Shape: strap; dense; medium length
Attitude: semi-nodding
Lemma awns: rough; long; green tip
Lemma veins: glabrous; green
Glumes: half the length of the lemma; completely covered with short hair
Glume awns: length equal to length of glumes; smooth, purplish tip
Rachis: slightly tapered segments; curved internode; numerous short hair on spike rachis edges
Spike emergence: spike emerges above flag leaf

Kernel characteristics

Type: hulless
Size: long and wide
Aleurone: yellow
Rachilla: medium length; medium length hairs; few abnormal rachilla
Basal marking: horseshoe depression
Protein content: intermediate
Quality: non-malting

Acceptable variants

1 hulled kernel per 1000 kernels in Breeder, Select and Foundation seed; 5 hulled kernels per 1000 in certified seed.

Performance

CDC Richard is a two-rowed hulless feed barley with a good combination of yield potential, threshability and scald and stem-rust resistance to allow it to be grown across the prairie region.

Maintenance of breeder seed

Crop Development Centre, University of Saskatchewan

Canadian distributor

SeCan Association

Recommended by

Prairie Registration Recommending Committee for Grain

Table 1. Grain yield (% of Abee) of CDC Richard and Abee, Western Co-operative Trials, 1987-1989*

Variety	Soil Type			
	Black	Brown	Black & Grey	Overall
Abee	100	100	100	100**
CDC Richard	85	83	82	83

*Locations: Black Soil - Brandon, Glenlea, Indian Head, Melfort, Morden, Portage la Prairie, North Battleford
Brown Soil - Acme, Elrose, Irricana, Lethbridge, Regina, Saskatoon, Scott, Swift Current, Watrous
Black & Grey Soil - Calmar, Lacombe, Olds 1, Olds 2, Provost

**Yield as % of Harrington; Actual overall grain yield for Harrington

Table 2. Agronomic characteristics of CDC Richard and Abee, Western Co-operative Two-Row Barley Trials, 1987-1989*

Variety	Days to Head	Plant Height (cm)	Lodging (1-9)**	Maturity (days)	1000 Kernel Weight (g)	Test Weight (kg/hl)	Pip. Kernels (%)
Abee	57.0	66.5	3.6	93.3	41.1	64.1	79
CDC Richard	55.7	70.7	4.6	92.5	39.0	73.1	59

*Locations: Black Soil - Brandon, Glenlea, Indian Head, Melfort, Morden, Portage la Prairie, North Battleford
Brown Soil - Acme, Elrose, Irricana, Lethbridge, Regina, Saskatoon, Scott, Swift Current, Watrous
Black & Grey Soil - Calmar, Lacombe, Olds 1, Olds 2, Provost

**1-9; 1 = best

Table 3. Yield and agronomic characteristics of CDC Richard and check varieties, Hulless Barley Co-operative Trials, 1988-1989*.

Variety	Yield (100's of kg/ha)	Days to Head	Maturity (days)	Plant Height (cm)	Lodging (1-9)	Kernel Weight (g)	Combine-		Viscosity (centi-stokes)	Protein (%)	Beta-glucan (%)
							Run Test Weight (kg/hl)	Cleaned Test Weight (kg/hl)			
Harrington	51.2	56.3	96.1	73	3.3	42.3	65.0	65.1	11.4	13.4	-
Scout	41.1	56.3	94.6	79	3.4	38.8	71.1	75.7	24.0	14.9	5.08
Condor	41.2	57.8	97.4	72	1.9	37.4	76.5	78.7	17.9	16.0	5.69
CDC Richard	43.2	55.5	98.0	78	3.3	40.0	75.4	77.5	8.9	14.2	4.46

*Locations: Beaverlodge, Brandon, Glenlea, Lacombe, Lethbridge, Olds, Goodale, Kernen, Trochu

Table 4. Yield and agronomic characteristics of CDC Richard and check varieties, Hulless Barley/Wheat Trials, 1987*

Variety	Grain Yield (100's of kg/ha)	Days to Head	Maturity (days)	Lodging (1-9)**	Plant Height (cm)	1000 Kernel Weight (g)	Test Weight (kg/hl)
Harrington	54.1	54.3	99.1	4.4	74	43.5	63.9
Scout	39.9	55.4	100.5	4.8	82	41.9	72.8
Condor	41.8	54.4	99.4	3.7	69	37.8	74.5
CDC Richard	47.3	53.7	96.5	6.1	74	41.2	75.5

*Locations: Beaverlodge, Brandon, Glenlea, Lacombe, Lethbridge, Goodale, Kernen

**1-9; 1 = best

Table 5. Yield (as % of Tupper) of CDC Richard and Tupper, Manitoba Crop Adaptation Trials, 1989*.

Variety	Manitoba Crop Zone					Overall
	1 & 2	3	4	5	6	
Tupper	100	100	100	100	100	100**
CDC Richard	105	99	114	99	102	104

*Locations: Bagot, Beausejour, Brandon, Dauphin, Glenlea, Mariapolis, Melita, Portage la Prairie, Roblin, Shoal Lake, Swan River, Teulong, The Pas, Vita, Waskada, Winnipeg

**Actual overall grain yield for Tupper was 3211 kg/ha

Table 6. Disease reaction summary for CDC Richard and check varieties, 1987-1989 Two-Row Western Co-operative and 1989 Hulless Barley Co-operative Trials*

Variety	Stem Rust				Scald (Wpg., inoc)			
	89HBC**	87C	88C	89C	89HBC	87C	88C	89C
Harrington	40MS-S	-	40MRMS	60MS-S	S	-	S	S
Scout	60MS-S	-	-	-	MS	-	-	-
Condor	30MRMS	30MRMS	-	-	MR	MS	-	-
CDC Richard	60MS	20MR	30MRMS	60MS-S	MR	R	R	R

Variety	Septoria				Common Root Rot	
	89HBC	87C	88C	89C	87-89C Saskatoon	87-89C Scott
Argyle	-	-	-	-	35	28
Harrington	S	S	S	S	-	-
Scout	S	S	S	S	-	-
Condor	S	S	S	S	-	-
CDC Richard	S	S	S	S	43	28

Variety	Scald (Field Ratings)				Net Blotch (Field Ratings)			
	88-89HBC (4)***	87C (1)	88C (3)	89C (1)	88-89HBC (4)	87C (1)	88C (2)	89C (1)
Harrington	6.5	-	6.2	9.0	7.3	-	7.4	6.5
Scout	5.9	-	-	-	7.0	-	-	-
Condor	5.6	3.0	-	-	6.5	8.0	-	-
CDC Richard	0.7	1.5	1.1	0.0	6.4	8.0	6.9	6.2

Table 6 (cont'd)

Variety	Net Blotch (inoc. at Winnipeg)											
	Race 102				Race 858				Race 857			
	88HBC	87C	88C	89C	89HBC	87C	88C	89C	89HBC	87C	88C	89C
Harrington	8	—	10	9	10	—	—	9	7	—	—	7
Scout	4	—	—	—	10	—	—	—	7	—	—	—
Condor	3	8	—	—	10	10	—	—	7	7	—	—
CDC Richard	7	10	8	10	10	10	10	10	7	7	7	7

Variety	Smuts											
	U. nuda				U. hordei				U. nigra			
	88HBC	87C	88C	89C	89HBC	87C	88C	89C	89HBC	87C	88C	89C
Harrington	93	—	80	66	32	—	33	25	15	—	17	16
Scout	46	—	—	—	32	—	—	—	20	—	—	—
Condor	71	58	—	—	32	23	—	—	11	5	—	—
CDC Richard	6	41	50	0	39	7	25	25	34	3	15	4

*1987-89 locations: Acme, Brandon, Elrose, Glenlea, Indian Head, Irricana, Lacombe, Calmar, Lethbridge, Melfort, Morden, North Battleford, Olds 1, Olds 2, Portage La Prairie, Provost, Regina, Saskatoon, Scott, Swift Current, Watrous

1989 locations: Brandon, Beaverlodge, Glenlea, Lacombe, Lethbridge, Olds, Saskatoon, Goodale, Saskatoon KCRF, Trochu

**HBC = Hulless Barley Co-operative, C = 6-row Western Co-operative Trials

***Number of stations of data